Asaph, the bones are in a similarly pulverulent state and produce clouds as they are disturbed. In a cave at Banwell in the Mendip Hills, England, thousands of bones of bison, horse and reindeer were taken out of a red silt which filled the cave to its roof. The entire deposit has been introduced by water through a vertical fissure which opened on the surface. In the Hyena Den, at Wookey Hole, "the organic remains were in all stages of decay, some crumbling to dust at the touch, while others were perfectly preserved and had lost very little of their gelatine." In an arm or section of this same cavern according to Dawkins, "most of the bones were as soft as wet mortar," an interesting statement which throws light upon the probable state of maceration which bones attain before disappearance by trituration or solution. The mineralization of the bones in the various caves, so patiently explored, presents striking differences. In some the bone seems reduced to the last stages of cohesion, while in others it has become filled with carbonate of lime or partially silicified, and attains a considerable gravity.

(*To be continued.*)

THE GEOGRAPHICAL DISTRIBUTION OF BATRACHIA AND REPTILIA IN NORTH AMERICA.

By E. D. Cope.

(*Continued from page 902.*)

III. The Eastern Subregion.

The fauna of Batrachia and Reptilia of this subregion is characterized by what it lacks as much as by what it possesses. The number of species which occupy its entire extent exclu-

judge from the air which was perfectly saturated with the pungent smell of certain animals, as well as from the traces of a lion impressed on the impalpable powder which covered the ground, where we met with a few quills of the *Hystrix africana*."

sively of other subregions is small, while a larger number are restricted to parts of it. Verrill divided it into four districts, viz.: the Carolinian, the Alleghenian, the Canadian, and the Hudsonian. These are distinguished by the ranges of mammals and reptiles, and the breeding-places of birds. The Carolinian fauna extends in a belt north of the Austroriparian subregion, from Long Island, south of the hill region of New Jersey, to the southeastern corner of Pennsylvania, and thence inland. It embraces a wide belt in Maryland and Virginia, and all of central North Carolina, and then narrows very much in passing round south of the Alleghenies of Georgia. It extends north again, occupying East Tennessee, West Virginia, Kentucky, Indiana, the greater parts of Illinois and Ohio, and the southern border of Michigan. It includes southern Wisconsin and Minnesota, all of Iowa, and the greater part of Missouri. The Alleghenian embraces the States north of the line just described, excepting the regions pertaining to the Canadian fauna, which I now describe. This includes northern Maine, New Hampshire and Vermont, with the Green Mountains, the Adirondacks and summits of the Allegheny Montains as far as Georgia. It includes Canada east and north of the lakes. The Hudsonian fauna is entirely north of the isothermal of 50°. It has great extent west of Hudson's Bay, and is narrowed southeastward to Newfoundland.

The information as to the distribution of the Batrachia and Reptilia now at hand, points to the following conclusions. The Hudsonian fauna need not be further referred to here, as it is part of the Holarctic region. The Canadian is sustained, as defined by the range of certain Batrachia. The demarkation between the Alleghenian and Carolinian is determined by the northern limit of most of the species common to the Eastern and Austroriparian subregions. An important division is indicated by the boundaries set to the range of certain species by the Allegheny Mountains. This division affects chiefly the Carolinian district of Verrill, and I therefore propose to abolish that name, and replace it by the two terms Cisalleghenian for Eastern, and Transalleganian for the Western districts. They are separated from each other by the Alleghenian district of

the foot hills, and the Canadian of the summits of the Alleghenies Mountains.

The species which are found over the entire eastern subregion, and not elsewhere, are the following:

Amblystoma jeffersonianum Green.
Plethodon cinereus Green.
Rana silvatica Lec.
Rana palustris Lec.
Osceola doliata triangula Boie.
Natrix fasciata sipedon Linn.
Eutænia sirtalis graminea Cope.

The Canadian district is characterized by the following species, which are restricted to it:

Amblystoma jeffersonianum laterale Hallow.
Gyrinophilus porphyriticus Green.
Desmognathus ochrophæa Cope.
Desmognathus nigra Green.
Bufo lentiginosus fowlerii Putn.
Rana cantabrigensis Baird.
Rana septentrionalis Baird.

The list above given as universally distributed in the Eastern subregion characterizes *the Alleghenian district.* I know of no species that is restricted to it. The genera which do not extend north of it are the following:

BATRACHIA:

Chorophilus,
Hyla,
Hemidactylium,
Cryptobranchus.
Necturus.

SAURIA:

Sceloporus,
Eumeces.

SERPENTES:

Carphophiops,
Coluber,
Cyclophis,
Natrix,
Ophibolus,
Heterodon,
Ancistrodon.
Systrurus,
Crotalus,

The two remaining districts include the large number of species which are common to the Eastern and Austroriparian subregions enumerated under the latter head. The Cisalleghenian is further characterized by the following:

Hyla andersonii Bd.
Rana virgatipes Cope.
Ophibolus rhombomaculatus Holbr.

To these must be added from the Austroriparian list:
Abastor erythogrammus Daud.

The following species are peculiar to the *Transalleghenian district:*

Chondrotus microstomus Cope.
Spelerpes maculicaudus Cope.
Rana areolata circulosa R. & D.
Carphophiops vermis Kenn.
Coluber vulpinus B. & G.
Ophibolus calligaster Say.
Eutænia radix B. & G.
Eutænia butlerii Cope.
Tropidoclonium lineatum Hallow.
Natrix kirtlandii Kenn.
Systrurus catenatus Raf.

Probably *Eutaenia brachystoma* Cope belongs to this district but only one specimen has been found.

The following species enter this district only from the Austroriparian:

Natrix grahamii B. & G.
Eutænia proxima Say.

Of the species peculiar to the Transalleghenian district, *Ophibolus calligaster* and *Tropidoclonium lineatum* extend into the northern limits of the Texan district.

The genera which do not range northward of the Cisalleghenian district are Cnemidophorus, Liolepisma and Abastor.

The total number of species of the Eastern subregion is thus:

Generally distributed,	7
Peculiar to Cisalleghenian,	3
Peculiar to Transalleghenian,	9
Peculiar to Canadian,	7
Common to Austroriparian,	34
	60

IV. The Austroriparian Subregion.

This subregion is the range of a large number of species of Batrachia and Reptilia, only a part of which occupy it to the exclusion of all other subregions, and another series of which occupy parts only of its area. Three centers of distribution

within its borders may be discerned—the Ocmulgian, the Louisianian and the Texan. The Texan is especially characterized by the combination of the Austroriparian fauna with a considerable number of the species of the Sonoran subregion. The characteristic Austroriparian species are the following:

TRACHYSTOMATA:

Siren lacertina L.

URODELA:

Amphiuma means Gard.
Amblystoma talpoïdeum Holbr.
Manculus quadridigitatus Holbr.

SALIENTIA:

Bufo lentiginosus lentiginosus Shaw.
Chorophilus occidentalis B. & G.
Hyla carolinensis Penn.
Engystoma carolinense.

LORICATA:

Alligator mississippiensis Daud.

SAURIA:

Ophisaurus ventralis Daud.
Anolis carolinensis.

SERPENTES:

Heterodon simus Linn.
Cyclophis æstivus Linn.
Zamenis flagelliformis Catesb.
Coluber spiloides D. & B.
Compsosoma corais couperii Holbr.
Osceola doliata syspila Cope.
Osceola doliata coccinea Schl.
Ophibolus getulus sayi Hobr.
Cemophora coccinea Blum.
Natrix clarkii B. & G.
Natrix fasciata fasciata L.
Natrix fasciata erythrogaster Shaw.
Natrix cyclopium D. & B.
Virginia valeriæ B. & G.
Haldea striatula L.
Tantilla coronata B. & G.
Elaps fulvius L.
Ancistrodon piscivorus Lacep.
Systrurus miliarius L.
Crotalus adamanteus adamanteus Beauv.

Thirty-one species and subspecies.

The Austroriparian shares with the Floridan subregion all of the above species except *Coluber spiloides, Natrix clarkii, Virginia valeriæ* and *Haldea striatula,* so far as yet known. It shares with the Eastern subregion the following thirty-four species.

PROTEIDA:

Necturus maculatus Raf.

URODELA:

Cryptobranchus alleghaniensis Daud.
Amblystoma opacum Grav.
Amblystoma punctatum L.
Amblystoma tigrinum Green.
Plethodon glutinosus Green.
Spelerpes guttolineatus Holbr.
Spelerpes ruber Daud.
Desmognathus fusca Raf.
Diemyctylus viridescens Raf.
Bufo americanus americanus Lec.
Scaphiopus holbrookii Harl.
Acris gryllus Lec.
Hyla versicolor Lec.
Rana pipiens pipiens Kalm.
Rana areolata B. & G.
Rana clamata Daud.
Rana catesbiana Shaw.

SAURIA:

Sceloporus undulatus Latr.
Cnemidophorus sexlineatus L.
Eumeces quinquelineatus L.
Liolepisma laterale Say.

SERPENTES:

Abastor erythrogrammus Daud.
Carphophiops amœnus Say.
Heterodon platyrhinus Latr.
Diadophis punctatus L.
Liopeltis vernalis L.
Zamenis constrictor L.
Coluber obsoletus Say.
Pityophis melanoleucus Daud.
Ophibolus getulus getulus L.
Eutænia sirtalis sirtalis L.
Ancistrodon contortrix L.
Crotalus horridus L.

The following species are restricted to the eastern part of the Austroriparian subregion, not extending west of the Atlantic drainage. To this district I have the name of *the Ocmulgian.*

PROTEIDA:

Necturus punctatus Gibbs.

URODELA:

Stereochilus marginatum Hallow.
Chondrotus cingulatus Cope.

SALIENTIA:

Bufo quercicus Holbr.
Chorophilus ornatus Holbr.
Chorophilus oculatus Holbr.

SERPENTES:

Abastor erythrogrammus Daud.
Rhadinæa flavilatus Cope.
Coluber quadrivittatus Holbr.
Natrix rigida Say.

The following species are restricted to the Ocmulgian and Louisianian districts with present information. First, all the Batrachia which the Austroriparian subregion shares with the Eastern, excepting *Amblystoma tigrinum, Diemyctylus viridescens, Acris gryllus, Rana areolata.* Second, *Farancia abacura* Holbr., *Coluber guttatus* L.

The following species are to be added to the general Austroriparian (p. 1007) to form the list of the Texan district:

PROTEIDA:

Typhlomolge rathbunii Stejn.

URODELA:

Diemyctylus meridionalis Cope.
Chondrotus texanus Matth.

SALIENTIA:

Bufo debilis B. & G.
Bufo punctatus B. & G.
Bufo valliceps Wiegm.
Bufo compactilis Wiegm.
Lithodytes latrans Cope.
Chorophilus triseriatus clarkii B. & G.

SAURIA:

Holbrookia texana Trosch.
Holbrookia maculata B. & G.
Crotaphytus collaris Say.
Sceloporus spinosus Wiegm.
Sceloporus consobrinus B. & G.
Phrynosoma cornutum Harl.
Eublepharis variegatus Bd.
Gerrhonotus liocephalus Wiegm.
Eumeces epipleurotus Cope.
Eumeces pachyurus Cope.
Eumeces brevilineatus Cope.
Eumeces tetragrammus Bd.
Eumeces obsoletus B. & G.

SERPENTES:

Diadophis amabilis docilis B. & G.
Diadophis amabilis stictogenys Cope.
Hypsiglena ochrorhynchus Cope.
Rhinochilus lecontei B. & G.
Coluber emoryi B. & G.
Osceola doliata annulata Kenn.
Ogmius episcopus episcopus Kenn.
Natrix rhombifera Hallow.
Natrix fasciata transversa Hallow.
Virginia elegans Kenn.
Eutænia proxima Say.
Eutænia elegans marciana B. & G.
Eutænia eques ocellata Cope.
Tantilla gracilis B. & G.
Tantilla nigriceps Kenn.
Systrurus catenatus edwardsii B. & G.
Crotalus adamanteus atrox B. & G.

Sixty-one species and subspecies, making a total for the Austroriparian as follows:

Generally distributed,	31
Shared with the Eastern subregion,	34
Ocmulgian only,	10
Louisianian and Ocmulgian only,	2
Texan exclusively (in the subregion),	38
	115

The species which enter the Texan territory from the Sonoran extend to various distances to the north and east. Thus, *Crotaphytus collaris* ranges to southern Missouri, and *Holbrookia maculata* to Arkansas. *Sceloporus spinosus* extends along the Gulf States to western Florida. *Phrynosoma cornutum* extends eastward to Dallas, Texas. *Rhinochilus lecontei* on the other hand has not been found east of Austin. Several species from the extreme southwest of Texas have not been included in the above lists, since some of them are well-known to belong to the Central American fauna, while the range of others is probably similar, but is not sufficiently known. Of the former kind are *Drymobius margaritiferus* Schl., *Sibon albofuscum* Lac., and *Coniophanes imperialis* B. & G.; of the latter are *Lystoptychus lateralis* Cope, *Holbrookia propinqua* B. & G. and *Hypopachus cuneus* Cope.

V. The Floridan Subregion.

The species and subspecies peculiar to this subregion are the following:

Batrachia:

Pseudobranchus striatus Lec.
Hyla gratiosa Lec.
Rana areolata æsopus Cope.

Sauria:

Eumeces egregius Bd.
Rhineura floridana Bd.

Serpentes:

Coluber rosaceus Cope.
Coluber guttatus sellatus Cope.
Osceola doliata parallela Cope.
Stylosoma extenuatum Brown.
Eutænia sackenii Kenn.
Seminatrix pygæa Cope.
Natrix usta Cope.
Natrix compressicauda Kenn.
Natrix fasciata pictiventer Cope.
Liodytes allenii Garm.

Species which are wanderers from the West Indian region are:

Lithodytes ricordii D. & B.
Sphærodactylus notatus Bd.
Crocodilus americanus Seba.

The *Rhadinæa flavilatus* Cope ranges throughout both the Floridan subregion and the Ocmulgian district. Two other species may be characteristic of the Floridan subregion, but only one specimen of each has been obtained. These are *Manculus remifer* Cope, and *Elaps distans* Kenn.

Species which the Floridan subregion shares with the Austroriparian are the following:

TRACHYSTOMATA:

Siren lacertina L.

AMPHIUMOIDEA:

Amphiuma means Gard.

PSEUDOSAURIA:

?Plethodon glutinosus Green.

SALIENTIA:

Bufo lentiginosus lentiginosus Shaw.
Bufo quercicus Holbr.
Hyla squirella Bosc.
Hyla femoralis Latr.
Hyla carolinensis Penn.
Acris gryllus Lec.
Chorophilus nigritus Lec.
Scaphiopus holbrookii Harl.
Rana pipiens sphenocephala Cope.
Rana castesbiana Shaw.

LORICATA:

Alligator mississipiensis Daud.

SAURIA:

Sceloporus undulatus Latr.
Cnemidophorus sexlineatus L.
Liolepisma laterale Say.
Eumeces quinquelineatus L.

SERPENTES:

Heterodon simus L.
Diadophis punctatus L.
Abastor erythrogrammus Daud.
Farancia abacura Holbr.
Coluber guttatus L.
Coluber quadrivittatus Holbr.
Zamenis constrictor L.
Zamenis flagelliformis Shaw.
Compsosoma corais couperii Holbr.
Pityophis melanoleucus Daud.
Ophibolus getulus getulus L.
Osceola doliata coccinea Schl.
Osceola elapsoidea Holbr.
Storeria dekayi Stor.
Natrix fasciata erythrogaster Shaw.
Natrix cyclopium D. & B.
Natrix taxispilotus Holbr.
Eutænia sirtalis sirtalis L.
Tantilla coronata B. & G.
Elaps fulvius L.
Systrurus miliarius L.
Crotalus adamanteus adamanteus L.

The total number of species of the Floridan subregion is as follows:

Peculiar species,	15
Species common to the Ocmulgian district,	1
Species common to the Louisianian district,	40
Species common to the West Indian region,	3
Little known species,	2
	61

VI. The Sonoran Subregion.

This subregion presents several natural divisions, as follows: I. The Lower Californian district, including only the region at the extremity of the peninsula of Lower California; II. The Chihuahuan district, embracing the State of Sonora, Mexico, the northern part of the Mexican Plateau, Arizona south of the San Francisco Mountains, most of the peninsula of Lower California, and most of New Mexico; III. The Basin district, embracing the Great Basin of Utah and Oregon, to Vernon, British Columbia; and IV. The Central district, which includes the high plains east of the Rocky Mountains, from Texas northward, excepting the river bottoms which cross it from west to east. This great subregion is bound together by the general distribution of numerous genera; but I do not know a single species which covers its entire area which is not found elsewhere. These define the districts.

The Lower Californian district is defined by the following fourteen species, which are restricted to it:

Hyla curta Cope.
Ctenosaura hemilopha Cope.
Uta thalassina Cope.
Uta nigricauda Cope.
Phyllodactylus unctus Cope.
Cnemidophorus maximus Cope.
Euchirotes diporus Cope.
Lichanura trivirgata Cope.
Zamenis aurigulus Cope.
Phyllorhynchus decurtatus Cope.
Pityophis vertebralis Blv.
Chilomeniscus stramineus Cope.
Tantilla planiceps Blv.
Crotalus enyo Cope.

The district shares with the Chihuahuan the following species:

Bufo punctatus B. & G.
Dipsosaurus dorsalis Hallow.
Crotaphytus wislizenii B. & G.
Callisaurus draconoides Blv.
Sauromalus ater Dum.
Uta stansburiana B. & G.
Uta ornata B. & G.
Sceloporus zosteromus Cope.
Phrynosoma coronatum Blv.
Phyllodactylus tuberculosus Wiegm.
Salvadora grahamiæ B. & G.
Ophilobolus getulus boylii B. & G.
Chilomeniscus fasciatus Cope.
Hypsiglena ochrorhynchus Cope.
Natrix valida Kenn.
Eutænia eques Reuss.
Trimorphodon lyrophanes Cope.
Crotalus adamanteus atrox B. & G.
Crotalus mitchellii Cope.

Species common to the Lower Californian district and the Western subregion (mostly to the Diegan district) are the following:

Hyla regilla B. & G.
Phrynosoma coronatum Blv.
Verticaria hyperythra Cope.
Gerrhonotus multicarinatus Blv.
Opibolus getulus boylii B. & G.
Opibolus getulus californiæ Blv.
Plethodon croceater Cope.

Total species of the Lower Californian district:

Peculiar to it,	14
Common to the Chihuahuan district,	18
Common to the Western subregion,	7
	39

Thirty-eight species, one being twice enumerated as common to the Chihuahuan district and Western region.

The Chihuahuan district possesses the following peculiar species:

BATRACHIA SALIENTIA:

Bufo alvarius Grd.
Hyla arenicolor Cope.

SAURIA:

Ctenosaura multispinis Cope.
Crotaphytus reticulatus Bd.
Callisaurus notatus Bd.
Callisaurus rufopunctatus Cope.
Callisaurus inornatus Cope.
Callisaurus scoparius Cope.
Uta symmetrica Bd.
Uta bicarinata Dum.
Uta graciosa Hallow.
Sceloporus clarkii B. & G.
Sceloporus couchii B. & G.
Sceloporus jarrovii Cope.
Sceloporus ornatus B. & G.
Phrynosoma solare Gray.
Anota modesta Gir.
Anota maccallii Hallow.
Heloderma suspectum Cope.
Gerrhonotus multifasciatus D. & B.
Cnemidophorus tessellatus Say.
Cnemidophorus inornatus B. & T.
Cnemidophorus octolineatus B. & S.
Cnemidophorus guttatus B. & G.
Eumeces guttulatus Hallow.

OPHIDIA:

Glauconia dissecta Cope.
Glauconia dulcis B. & G.
Glauconia humilis B. & G.
Lichanura roseofusca Cope.
Diadophis regalis regalis B. & G.
Heterodon nasicus kennerlyi Kenn.
Zamenis semilineatus Cope.
Coluber emoryi B. & G.
Rhinechis elegans Kenn.
Pityophis sayi sayi Schl.
Epiglottophis pleurostictus D. & B.
Ophibolus getulus splendidus B. & G.
Chionactis occipitalis Hallow.
Chilomeniscus ephippicus Cope.
Gyalopium canum Cope.
Eutænia megalops Kenn.
Eutænia elegans marciana B. & G.
Eutænia elegans dorsalis B. & G.
Eutænia augustirostris Kenn.
Eutænia nigrilatus Brown.
Eutænia rufopunctata Cope.
Eutænia multimaculata Cope.
Trimorphodon upsilon Cope.
Trimorphodon lambda Cope.
Trimorphodon wilkinsonii Cope.
Scolecophis æmulus Cope.
Elaps euryxanthus Kenn.
Crotalus molossus B. & G.
Crotalus scutulatus Kenn.
Crotalus lepidus Kenn.
Crotalus cerastes Hallow.

Fifty-eight species, disposed of as follows: Batrachia salientia, 2; Sauria, 25; Serpentes, 31. Three species of Testudnata are peculiar to this district, viz.: *Kinosternum henrici* Lec., *K. flavescens* Agass., *Xerobates agasizii* Cooper. This district possesses a larger number of peculiar species than any other in the Medicolumbian Region.

The Basin district has but few peculiar species. Its southern boundary may be regarded as the San Francisco Mountains in northern Arizona. The *Crotalus tigris* which is restricted to it has been shown by Merriam to inhabit only the mountains, and its northern limit is as yet unknown. The following are the species of the Great Basin:

BATRACHIA:

Amblystoma tigrinum Green.
Spea intermontana Cope.*
Rana draytonii onca Cope.*
Rana pipiens brachycephala Cope.*

SAURIA:

Crotaphytus collaris Say.†
Crotaphytus wislzenii B. & G.†
Uta stansburiana B. & G.†
Sceloporus biseriatus Hallow.†
Sceloporus graciosus B. & G.†
Sceloporus consobrinus B. & G.†
Phrynosoma douglassii ornatissimum Gird.†
Anota platyrhina Gird.†
Zamenis tæniatus Hallow.†
Pityophis sayi bellona B. & G.†
Chionactis episcopus isozonus Cope.*
Eutænia elegans vagrans B. & G.
Crotalus tigris B. & G.†
Crotalus confluentus lecontei Hallow.

The species and subspecies peculiar to the Basin district are marked with a star, and those found also in the Chihuahuan with a dagger.

The Central district possesses but few peculiar species. These with certain Chihuahuan species give it a distinctive character. There are also a few species which enter it from the Eastern subregion. These are marked with a dagger, while the peculiar forms are marked with a star.

URODELA:

Amblystoma tigrinum Green.

SALIENTIA:

Bufo cognatus Say.*
Spea hammondii bombifrons Cope.*

SERPENTES:

Heterodon nasicus nasicus B. & G.*
Ophibolus multistratus Kenn.*
Zamenis constrictor L.†
Eutænia radix B. & G.†
Eutænia sirtalis parietalis Say.
Eutænia elegans vagrans B. & G.
Crotalus confluentus confluentus Say.

SAURIA:

Crotaphytus collaris Say.
Holbrookia maculata B. & G.
Phrynosoma douglassii hernandesii Gir.*
Eumeces septentrionalis Bd.*
Eumeces multivirgatus Hallow.†
Eumeces obsoletus B. & G.

The species not marked with dagger or star are Chihuahuan, except *Eutænia elegans vagrans*, which is also found in the Basin district, *E. sirtalis parietalis*, which extends to the Pacific district, and the *Amblystoma tigrinum*, which is Medicolumbian throughout.

The total number of species of the Sonoran subregion is as follows:

Peculiar to the Chihuahuan district,	58
Common to Lower Californian and Chihuahuan districts,	19
Peculiar to the Lower Californian district,	14
Peculiar to the Basin district,	6
Common to the Basin and Chihuahuan,	8
Peculiar to the Central district,	8
Common to the Central and Chihuahuan,	3
Common to the Chihuahuan and Texan,	14
	126
Doubles emplois,	4
	122

VII. The Western Subregion.

This subregion presents two distinct modifications, a northern and a southern. The boundary between the two has not yet been defined; it represents the demarkation between the greater humidity of the north and the arid conditions of the south. The name of Diegan has been given by Mr. Van Denberg to the southern region; to the northern I propose to restrict the name Pacific, which I formerly used for the entire subregion, which had been previously named the Western by Baird. The Pacific district extends further south along the Sierra Nevada than in the San Joaquin Valley. Some of the forms of the Diegan district extend north to the latitude of San Francisco, but the majority of the species are restricted to more southern latitudes. How far the Diegan district extends on the Lower Californian Peninsula is uncertain. The separation from the Chihuahuan district is also undertermined, and the species of both districts mingle in some degree on their borders.

Species peculiar to the Diegan district are the following:

Batrachia:

Bufo columbiensis halophila B. & G.

Sauria:

Uta repens Van Denberg.
Uta mearnsii Stejneger.
Sceloporus orcuttii Stejneger.
Sceloporus vandenbergianus Cope.
Phrynosoma cerroënse Stejneger.
Anota goodei Stejneger.
Xantusia vigilis Bd.
Xantusia riversiana Cope.
Xantusia picta Cope.
Zablepsis henshavii Stejneger.
Amæbopsis gilbertii Van Denburg.
Verticaria sericea Van Denberg.
Cnemidophorus tessellatus multiscutatus Cope.
Cnemidophorus tessellatus rubidus Cope.
Anniella pulchra Gray.

Serpentes:

Lichanura orcuttii Stejn.
Diadophis amabilis amabilis B. & G.
Crotalus ruber Cope.

To these must be added the species already enumerated as common to the Diegan and Lower Californian districts, and the following list of species which occur also in the Chihuahuan district:

Crotaphytus wislizenii B. & G.
Callisaurus draconoides Blv.
Uta stansburiana B. & G.
Sceloporus biseriatus Hallow.
Lichanura roseofusca Cope.
Crotalus adamanteus atrox B. & G.

The following species are common to the Diegan and Pacific districts:

BATRACHIA:

Diemyctylus torosus Esch.
Hyla regilla B. & G.*

SAURIA:

Phrynosoma blainvillii Gray.
Gerrhonotus multicarinatus Blv.*
Gerrhonotus burnettii Gray.
Eumeces skiltonianus B. & G.

SERPENTES:

Charina bottæ Blv.
Zamenis lateralis Hallow.
Zamenis tæniatus Hallow.*
Pityophis catenifer Blv.
Ophibolus getulus boylii B. & G.*
Eutænia elegans couchii Kenn.*
Eutænia infernalis infernalis Blv.
Crotalus confluentus lucifer B. & G.

These species are then characteristic of the Western subregion as a whole, except those marked with a star, which occur elsewhere.

The Pacific district is especially characterized by certain genera and species of Batrachia. No certainly known genus of scaled reptiles, and a limited number of species and subspecies are peculiar to it. Conspicuous among these are the species of Eutænia, which display great variety, while they are but sparsely represented in the Diegan district. The peculiar species are as follows:

URODELA:

Amblystoma macrodactylum Baird.
Amblystoma epixanthum Cope.
Chondrotus paroticus Baird.
Chondrotus decorticatus Cope.
Chondrotus aterrimus Cope.
Chondrotus tenebrosus B. & G.
Batrachoseps caudatus Cope.
Batrachoseps attenuatus Esch.
Plethodon intermedius Bd.
Plethodon oregonensis Gird.
Autodax lugubris Hallow.
Autodax iëcanus Cope.
Autodax ferreus Cope.
Diemyctylus torosus Esch.
Bufo columbiensis columbiensis B. & G.
Spea hammondii hammondii Bd.
Rana temporaria pretiosa Bd.
Rana cantabridgensis latiremis Cope.
Rana agilis aurora B. & G.
Rana draytonii Baird.
Rana boylii Baird.

SAURIA:

Sceloporus undulatus occidentalis Bd.
Phrynosoma douglassii douglassii Bell.
Gerrhonotus principis B. & G.
Cnemidophorus septemvittatus Cope.

SERPENTES:

Diadophis amabilis pulchellus B. & G.
Zamenis constrictor vetustus B. & G.
Contia mitis B. & G.
Eutænia elegans elegans B. & G.
Eutænia elegans lineolata Cope.
Eutænia elegans ordinoides B. & G.
Eutænia infernalis vidua Cope.
Eutænia sirtalis parietalis Say.
Eutænia sirtalis trilineata Cope.
Eutænia sirtalis pickeringii B. & G.
Eutænia sirtalis tetratænia Cope.
Eutænia sirtalis concinna Hallow.
Eutænia biscutata Cope.
Eutænia leptocephala B. & G.

There are therefore peculiar to the Pacific district eighteen species and three subspecies of Batrachia (two species found in the Holarctic region represented by subspecies, and one species

from the Canadian); two species and two subspecies of lizards; and three species and eleven subspecies of snakes.

We have of species and subspecies of the Western subregion the following synopsis:

Peculiar to the Diegan district, ...	19
Common to the Diegan and Chihuahuan, . .	6
Common to the Diegan and Pacific, ...	11
Peculiar to the Pacific, ...	39
	75

VIII. The Toltecan Subregion.

This subregion includes three districts which possess characteristic species, and which differ in climate. The Austroriental is a humid region with abundant rains and fogs, and includes the eastern face and slope of the central plateau, with the mountain elevations, including parts of the States of Puebla, Vera Cruz, Hidalgo and San Louis Potosi. It is cut off to the north from the Austroriparian subregion by an interval in the States of Nuevo Leon and Tamaulipas. The middle or Austrocentral district includes the valleys of Mexico and Toluca, and the region northward to the edge of the Sonoran subregion, including the State of Guanajuato, and perhaps further north. The climate of this district is much less humid than that of the Austroriental district. The Austroccidental district includes the high lands of Oaxaca, Guerrero, Michoacan and Jalisco. It is the most arid of the three divisions, and extends furthest to the south and west.

The northern boundary of the Toltecan district is not yet determinable; hence it is not possible to state whether species from the States of Durango and Zacatecas, such as *Eutænia angustirostris*, should be referred to it or not. A small collection made by Wilkinson in southern Chihauhua at Batopilas[1] has the character of the Chihuahuan fauna, with the following species not otherwise found in it:

Anolis nebulosus Wiegm.
Uta bicarinata Dum.
Scolecophis æmulus Cope.

[1] Cope, Proceeds. Amer. Philosoph. Soc., 1879, p. 261.

The humid and dry districts of the Toltecan subregion repeat *in petto* the differences between the Austroriparian and Sonoran subregions. The Austroriental district is distinguished by the larger number of batrachian genera and species, and of certain genera of Crotalidæ. It also includes some genera which may be regarded as immigrants from the Central American region of the Neotropical Realm.

The characteristic species of the *Austrocentral district* are[2]:

BATRACHIA URODELA:

Siredon mexicanum Shaw.
Amblystoma tigrinum Green.

BATRACHIA SALIENTIA:

Bufo compactilis Wiegm.
Bufo intermedius Gthr.
Spea multiplicata Cope.
Spea hammondii Bd.
Hyla eximia Bd.
Hyla arenicolor Cope.
Rana montezumae Bd.

TESTUDINATA:

Kinosternum pennsilvanicum.
Onychotria mexicana Gray.

SAURIA:

Phrynosoma orbiculare Wiegm.
Sceloporus scalaris Wiegm.
Sceloporus microlepidotus Wiegm.
Sceloporus torquatus Green.
Sceloporus minor Cope.
Sceloporus melanogaster Cope.
Barissia imbricata Wiegm.
Cnemidophorus guttatus B. & G.
Eumeces brevirostris Gthr.

SERPENTES:

Conopsis nasus Gthr.
Toluca lineata Kenn.
Chionactis varians Jan.
Salvadora bairdii Jan.
Epiglottophis pleurostictus D. & B.
Hemigenius variabilis Dugés.
Natrix storerioides Cope.
Eutænia macrostemma Kenn.
Eutænia eques Reuss.
Eutænia pulchrilatus Cope.
Eutænia scaliger Jan.
Eutænia melanogaster Wiegm.
Tantilla bocourtii Gthr.
Tantilla calamarina Cope.
Crotalus basiliscus Cope.
Crotalus polystictus Cope.

[2] For the exact habitat of several of these I am indebted to the important papers of Dr. A. Dugés, in La Naturaleza, 1888, p. 97, and 1896 p. 3.

Of these species the following occur in the Chihuahuan district:

Amblystoma tigrinum Green.
Spea hammondii Bd.
Hyla arenicolor Cope.
Sceloporus scalaris Wiegm.
Sceloporus microlepidotus Wiegm.
Cnemidophorus guttatus B. & G.
Epiglottophis pleurostictus D. & B.
Eutænia macrostemma Kenn.
Eutænia eques Reuss.

The Austroriental district includes the mountainous region which bounds the Mexican Plateau on the east, from some part of the State of Puebla to a point to the north not yet ascertained. It is probably separated by a considerable interval from the Austroriparian in the States of Tamaulipas and Nuevo Leon. Its climate is moist, and vegetation is abundant, and of principally Medicolumbian type. Various peculiar species of Acer, Platanus, Quercus, Andromeda and other forms are abundant. The Batrachian and Reptilian species are the following:[3]

BATRACHIA URODELA:

Spelerpes chiropterus Cope.
Spelerpes leprosus Cope.
Spelerpes cephalicus Cope.
Spelerpes orizabensis Blatchley.
Spelerpes gibbicaudus Blatchley.
Oedipina lineola Cope.
Thorius penuatulus Cope.

BATRACHIA SALIENTIA:

Hyla gracilipes Cope.
Hyla miotympanum Cope.
Hyla bistincta Cope.
Smilisca baudinii D. &. B.

SAURIA:

Sceloporus variabilis Wiegm.
Sceloporus æneus Wiegm.
Sceloporus microlepidotus Wiegm.
Phrynosoma orbiculare Wiegm.
Phrynosoma taurus Dugés.
Barissia imbricata Wiegm.
Barissia antauges Cope.
Gerrhonotus gramineus Cope.
Gerrhonotus tæniatus Wiegm.
Gerrhonotus liocephalus Wiegm.

[3] For a knowledge of the distribution of many of these species I am indebted to Francois Sumichrast, in Archives des Sciences, in Bibliotheque Universelle, 1873, p. 233, and *in litteris.*

Celestus enneagrammus Cope.
Liolepisma laterale Say.
Anelytropsis papillosus Cope.

SERPENTES:

Atractus latifrontalis Garm.
Ficimia olivacea Gray.
Epiglottophis lineaticollis Cope.
Osceola doliata polyzona Cope.
Ninia diademata B. & G.
Storeria dekayi Stor.
Storeria occipitomaculata Holbr.
Rhadinæa vittata Jan.
Rhadinæa decorata Gthr.
Eutænia sumichrastii Cope.
Eutænia chrysocephala Cope.
Eutænia pulchrilatus Cope.
Eutænia scalaris Cope.
Eutænia phenax Cope.
Sibon frenatum Cope.
Sibon personatum Cope.
Sibon albofuscum Lac.
Bothriechis mexicanus D. & B.
Ophryacus undulatus Jan.
Systrurus ravus Cope.
Crotalus triseriatus Wagl.

Of all the above species the following are found also in the Austrocentral district:

Barissia imbricata Wiegm.
Sceloporus variabilis Wiegm.
Sceloporus microlepidotus Wiegm.
Phrynosoma orbiculare Wiegm.
Eutænia pulchrilatus Cope.

Species found in the Austroriparian subregion:

Liolepisma laterale Say.
Storeria dekayi Stor.
Storeria occiptomaculata Holbr.

To the Austroriental list might be added *Spelerpes bellii* Gray, which is stated by Sumichrast to inhabit also the Tierra Caliente; and *Anolis nannodes* Cope, which the same authority says ranges from the Tierra Caliente into the Alpine district. The water-snake *Natrix rhombifera* Hallow. may occur in the Austroriental district, but this needs confirmation.

The *Austroccidental district* is inhabited by a number of peculiar species, together with some which occur in the other two districts of the Toltecan subregion. One peculiarity of this district is the poverty in Batrachia and the absence of Urodela. The peculiar species are the following:

BATRCHIA ANURA:

Leptodactylus melanonotus Hallow.
Hypopachus variolosus Cope.

SAURIA:

Sceloporus siniferus Cope.
Sceloporus horridus Wiegm.
Sceloporus rubriventris Gthr.
Sceloporus pyrrhocephalus Cope.
Sceloporus omiltemanus Gthr.
Sceloporus dugesii Boc.
Sceloporus bullerii Boul.
Sceloporus heterolepis Boul.
Cnemidophorus deppei lineatissimus Cope.
Eumeces callicephalus Boc.

SERPENTES:

Pseudoficimia frontalis Cope.
Sympholis lippiens Cope.
Atractus omiltemanus Gthr.
Adelophis copei Dugés.
Rhadinæa laureata Gthr.
Eutænia godmanii Gthr.
Chionactis michoacanensis Dugés.
Coniophanes lateritius Cope.
Conophis vittatus Pet.
Himantodes gemmistratus latistratus Cope.
Sibon personatum Cope.
Manolepis nasutus Cope.

Of the above species there are found in the Tierra Caliente:

Sceloporus siniferus Cope.
Sceloporus horridus Wiegm.
Sceloporus pyrrhocephalus Cope.
Conophis vittatus Pet.
Sibon personatum Cope.
Manolepis nasutus Cope.

And in the region south to Costa Rica:

Hypopachus variolosus Cope.
Himantodes gemmistratus Cope.

The Austroccidental district shares with the Austrocentral the following:

BATRACHIA ANURA:

Bufo compactilis Wiegm.
Hyla eximia Bd.
Rana pipiens austricola Cope.

SAURIA:

Phyllodactylus tuberculosus Wiegm.
Uta bicarinata Dum.
Barissia imbricata Wiegm.

Cnemidophorus guttatus B. & G.
Sceloporus scalaris Wiegm.
Phrynosoma orbiculare Wiegm.
Anolis nebulosus Wiegm.

SERPENTES:

Drymobius margaritiferus Schl.
Diadophis lætus Cope.
Osceola doliata polyzona Cope.
Hemigenius variabilis Dugés.
Natrix storerioides Cope.
Eutænia eques Reuss.
Eutænia melanogaster Wiegm.
Epiglottophis pleurostictus D. & B.
Tantilla calamarina Cope.
Trimorphodon biscutatus D. & B.
Trimorphodon upsilon Cope.
Crotalus triseriatus Wagl.
Crotalus polystictus Cope.
Crotalus basiliscus Cope.

A number of species inhabit the Austroccidental and Austroriental districts, passing to the southward of the Austrocentral, at least so far as present information extends. These are the following:

BATRACHIA ANURA:

Smilisca baudinii D. & B.

SAURIA:

Sceloporus torquatus Green.
Phrynosoma taurus Dugés.
Gerrhonotus oaxacæ Gthr.

SERPENTES:

Rhadinæa vittata Jan.
Eutænia chrysocephala Cope.
Coniophanes proterops Cope.
Ophryacus undulatus Jan.
Crotalus triseriatus Wagl.

The species of the Toltecan subregion are as follows:

Austroriental district,	44
Austrocentral district,	36
Austroccidental district,	24
	73
Doubles emplois,	2
	71

VIII. Recapitulation.

The number of species of Reptilia Squamata of the Medicolumbian region is as follows. The species of Batrachia have been already enumerated in my book on that class.[4]

Superfamilies.	Families.	Genera.	Species.
	SAURIA.		
Pachyglossa	Iguanidæ	12	79
Nyctisaura	Gecconidæ	2	2
	Eublepharidæ	1	1
Helodermatoidea	Helodermidæ	1	1
Diploglossa	Anguidæ	4	17
Leptoglossa	Tiidæ	2	11
	Xantusiidæ	3	5
	Scincidæ	2	20
	Anelytropsidæ	1	1
Annielloidea	Anniellidæ	1	2
Annulati	Euchirotidæ	1	1
	Amphisbænidæ	1	1
	Total Sauria	31	141
	SERPENTES.		
Catodonta	Glauconiidæ	1	3
Colubroidea	Boidæ	1	3
	Charinidæ	1	2
	Colubridæ	26	133
	Dipsadidæ	10	19
	Elapidæ	1	3
Solenoglypha	Crotalidæ	5	25
	Total Serpentes	45	188
	Sauria	31	141
Total Squamata		76	329

[4] The Batrachia of North America, Bulletin of the U. S. Natl. Museum, No. 34, 1889, p. 451. The species of the Toltecan subregion are mostly omitted from this book.